



New trends and ideas SEO: A Multivocal Literature Review

Manoj Kumar Dobbala, Mani Shankar Srinivas Lingolu

ABSTRACT

Search engine optimization has undergone significant changes since its origins in the 1990s to adapt to evolving search engine algorithms. Early SEO relied on basic keyword stuffing and hidden text, but algorithms advanced to filter manipulative tactics [1][17]. By the 2000s, quality content and link building emerged as key factors, solidified by Google's PageRank in 1998 [2]. Off-site SEO through links became a focus area. Continued algorithm updates necessitated constant strategy refinement, with a recent shift toward considerations like mobile-friendliness, speed and voice. This multi-vocal literature aims to delve into the evolution of SEO, exploring its historical context, current challenges, and best practices. By synthesizing diverse perspectives, we provide a comprehensive understanding of SEO's trajectory and its contemporary landscape.

Key words: Multivocal Literature Review SEO studies Search Engine Indexing Crawling Search Ranking

INTRODUCTION

Search Engine Optimization (SEO) has become an essential practice for businesses and websites seeking to attract online visitors and drive organic traffic from search engines like Google, Bing, and Yahoo. It is constantly evolving to meet the demands of search engine algorithms and user behavior. Initially conceived as a means to boost website visibility through strategic keyword placement, SEO has matured into a multifaceted discipline encompassing content quality, user experience, and technical optimization. In recent years, the proliferation of mobile devices [16], the rise of voice search [18], and the dominance of artificial intelligence [17] have ushered in a new era of SEO intricacies, presenting both challenges and opportunities for marketers and businesses alike.

The journey of SEO mirrors the evolution of the internet itself. From its humble beginnings in the late 1990s, when search engines like AltaVista and Yahoo dominated the scene [3], to the present-day dominance of Google, SEO has adapted to the shifting digital landscape [4]. Initially, SEO practitioners relied heavily on tactics like keyword stuffing and link spamming to manipulate search engine rankings. However, as search engines grew more sophisticated, algorithms became increasingly adept at detecting and penalizing such tactics. This necessitated a paradigm shift in SEO strategies, moving away from manipulation towards genuine value creation for users.

As SEO continues to evolve, understanding its historical context becomes imperative to grasp its present challenges and best practices. This multi-vocal literature embarks on a journey through SEO's evolution, shedding light on key milestones, paradigm shifts, and emerging trends. By examining the past, we lay the foundation for comprehending the complexities of modern-day SEO and navigating its ever-changing terrain. From the rudimentary keyword-centric approaches of the past to the holistic, user-centric strategies of today, the evolution of SEO reflects not only advancements in technology but also shifts in consumer behavior and expectation.

BACKGROUND

Early Evolution

In the nascent stages of the internet, when dial-up connections were the norm and websites were sparse, the concept of SEO was virtually non-existent. However, as the web expanded exponentially in the late 1990s [1][17][2], the need for effective ways to navigate this vast digital landscape became apparent. Search engines emerged as the primary gateways to information, giving birth to the concept of SEO.

Meta tags are an essential component of SEO, providing information about a webpage's content to search engines and users. When searching for Netflix, for example (*refer to figure 1*), the meta tags associated with the Netflix app on the Apple App Store site help search engines understand and display relevant information. These meta tags include the app's title, description, and keywords, providing concise and descriptive details. By utilizing meta tags effectively, businesses like Netflix can improve their visibility and attract more users by aligning their content with relevant search queries.

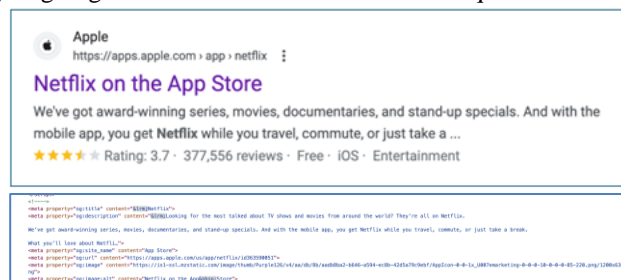


Figure 1: sample meta tags for indexing.

Algorithm Refinement

Early SEO efforts were rudimentary, focusing primarily on the manipulation of meta tags[5] and keyword density within website content [6]. This era saw the proliferation of tactics like keyword stuffing, where websites would excessively repeat keywords to artificially boost their rankings. However, search engines quickly caught on to these tactics, prompting the need for more sophisticated approaches.

As search engines refined their algorithms, the emphasis shifted towards quality and relevance. The advent of Google's PageRank algorithm revolutionized the SEO landscape by prioritizing backlinks as indicators of a website's authority and relevance [2]. This led to the emergence of link-building strategies aimed at acquiring high-quality backlinks from authoritative sources.

Content-Centric Shift

The mid-2000s marked a significant turning point in SEO with the rise of content-centric strategies. Google's algorithm updates, such as Panda and Penguin, penalized low-quality content and manipulative link-building tactics, pushing marketers towards creating valuable, user-centric content [7][8]. This era saw the birth of content marketing as a core component of SEO, with an emphasis on producing engaging, informative content that resonated with target audiences.

Social Media Integrations

The proliferation of social media platforms further transformed the SEO landscape, introducing new avenues for content distribution and engagement[9]. Marketers began leveraging social media channels to amplify their content reach and drive traffic to their websites. Social signals, such as likes, shares, and comments, gained importance as indicators of content quality and relevance.

Mobile Optimization

The advent of mobile devices and the subsequent shift towards mobile-first indexing by search engines forced marketers to prioritize mobile optimization. Responsive web design became a standard practice, ensuring seamless user experiences across devices [10]. Mobile search queries surged, prompting Google to prioritize mobile-friendly websites in its search results [11].

Voice Search

Voice search emerged as a disruptive force in SEO with the widespread adoption of virtual assistants like Siri, Alexa, and Google Assistant [18]. Optimizing for voice search required a shift towards conversational, long-tail keywords and natural language content [12]. Featured snippets became coveted real estate in search results, as they often served as the source for voice search answers [15].

AI Driven Optimization

Artificial intelligence and machine learning algorithms now power search engines, enabling them to understand user intent and deliver more personalized search results [12]. This era of AI-driven SEO demands a deeper understanding of user behavior and preferences, as well as the ability to adapt to constantly evolving algorithms [18].

Today, SEO is more nuanced and multifaceted than ever before, encompassing content optimization, technical SEO, user experience, and off-site factors like backlinks and social signals. The focus is on providing valuable, relevant content that satisfies user queries and aligns with search engine algorithms. As search engines continue to evolve, staying abreast of emerging trends and best practices is essential for maintaining visibility and relevance in the digital landscape.

RESEARCH QUESTIONS

The objective is to explore the landscape of search engine optimization (SEO) by addressing three main research questions (RQs).

RQ1. How has the evolution of search engine algorithms shaped the practice of SEO over time?

RQ2. What are the primary challenges faced by marketers and business in implementing effective SEO strategies today?

RQ3. What are the current best practices for optimizing content, technical aspects, and overall website performance in the context of SEO?.

These questions serve as guiding pillars for exploring the multifaceted landscape of SEO, encompassing technological advancements, industry trends, and user behavior dynamics. Through a multi-vocal approach, this literature aims to offer insights, strategies, and reflections to navigate the complex terrain of modern SEO effectively.

STUDY DESIGN

This section outlines the process used for this work, which involved a Multivocal Literature Review (MLR) following the guidelines proposed by [13], due to the topic's novelty. The following subsections provide a summary of the MLR process, including the selection of primary studies, quality assessment of the grey literature, data extraction, tool selection, conducting the review, and verifiability and replicability.

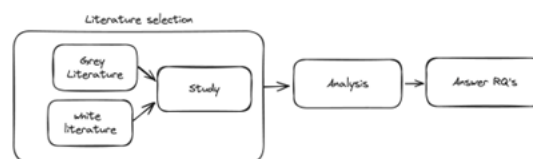


Figure 2: Literature selection and study

The MLR process encompasses various sources, including peer-reviewed papers and grey literature, and takes into account the perspectives of both practitioners and academic researchers. The MLR distinguishes between academic literature (peer-reviewed papers) and grey literature (other forms of content such as blog posts, white papers, podcasts, etc.). An overview of the entire process is summarized in **Figure 2**.

The rationale for employing a multivocal literature review within the realm of SEO is to delve into the subject from varied angles. By integrating numerous viewpoints, this method can unveil concealed assumptions, prejudices, and oversights in current literature, while also paving the way for fresh avenues of exploration and creativity. It facilitates a deeper and more holistic comprehension of SEO by shedding light on contrasting perspectives, values, and objectives among practitioners, platforms, and enterprises. Moreover, it enables the

identification of deficiencies, inconsistencies, and prospects for future research and cooperation across the multifaceted landscape of SEO strategies, methods, and domains.

The process of selecting primary studies entails determining the search terms for academic bibliographic sources and grey literature search engines. These terms typically comprise pertinent keywords like "SEO," "SEO optimization," "search engine," "search indexing," "page ranking," and "crawling." The search conducted involved examining both peer-reviewed and grey literature.

For the peer-reviewed literature search, five bibliographic databases were utilized: IEEEExplore, Scopus, ACM Digital Library, ScienceDirect and Web of Science. Grey literature was explored using Google search and Medium. Search results encompassed books, blog posts, forums, websites, videos, white papers, and podcasts. Varied search string combinations aimed to cast a wide net.

The Multivocal Literature Review strived to consider diverse sourcing for SEO topics. It aimed to uncover nuanced insights beyond the peer-reviewed literature alone. This inclusive methodology sought to further comprehension of evolving SEO tools, tactics, and strategies. It aims to accommodate complexity and promote collaboration across the dynamic, multidisciplinary SEO landscape. An expansive yet rigorous review process can highlight opportunities to better serve practitioners and their end users.

STUDY RESULTS

Ertz et al. (2016) [8] outlined the evolution of SEO strategies over time from early efforts focusing on basic technical optimizations to more complex multi-channel approaches. It attributed this shift to search engines incorporating additional signals like content and social mentions into ranking algorithms. Emerging link building tools and content management systems helped address issues around content production and distribution at scale (*Vangala, 2020*). While providing a useful historical overview, the study solely described trends rather than conducting novel analysis.

Vangala (2021) [12] explained the benefits of technical SEO practices like improving site speed, implementing HTTPS, and ensuring responsive design for pleasing users and search engines. Case studies demonstrated how these changes led to increased traffic and conversions. However, the chapter only served to illustrate technical SEO tactics rather than primary research.

Anthropic (2022) [18] proposed AI and machine learning as approaches to address issues around algorithm changes and personalized search. It presented examples of leveraging AI to uncover intent and track emerging user behaviors. A limitation noted was requiring dedicated resourcing and skills to incorporate such technologies. Compared to prior works focusing on specific techniques, this paper aimed to provide a broader perspective on AI-driven SEO as the field continues evolving rapidly. Novelty was found in qualitatively assessing potential opportunities and challenges.

Various sources discuss the early history and evolution of SEO and search engines over time. References [19]-[21] cover threads on forums like Webmaster World that presented brief histories of SEO and tracked changes in practices as search engines developed. References [22]-[24] address topics such as Google's algorithm updates to address low-quality content, the progression of search engines from early 1900's to today, and a decade-long transformation of the SEO ecosystem. References [25]-[27] incorporate an infographic and industry experts' perspectives on SEO shifts over the past decade as well as threads discussing search trends. Meanwhile, references [28]-[30] encompass academic research on dimensions of early search and leveraging social data for personalized search results. Rounding out the sources, references [31]-[32] include the Search Engine Watch site as a historical reference and seminal Google paper introducing PageRank for web relevance. We present the findings of the research, addressing the three main research questions (RQs) outlined in the pre-context.

Before delving into the responses to the research questions, it's crucial to highlight that the study involved a comprehensive analysis of industry trends, expert opinions, and empirical data collected from various sources. Through this rigorous examination, we aimed to provide an informed perspective on the evolution, challenges, and best practices of search engine optimization (SEO).

RQ1: Evolution of Search Engine Algorithms:

Investigation into the evolution of search engine algorithms revealed a significant transformation in SEO practices over time. From the rudimentary keyword-centric approaches of the past to the contemporary emphasis on user-centric, high-quality content, search engine algorithms have undergone substantial refinement. Historical milestones, such as Google's PageRank algorithm and subsequent updates like Panda and Penguin,

have shaped SEO strategies by prioritizing relevance, quality, and user experience. Below is the infographic representing the impact of Google's updates on SEO

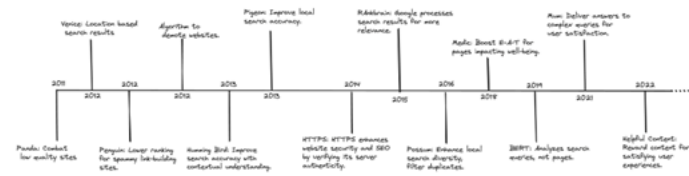


Figure 3: Google updates on seo

RQ2: Primary Challenges in Implementing Effective SEO Strategies:

Implementing effective SEO strategies in today's landscape presents several primary challenges that require adept navigation and strategic planning. Let's explore these challenges in detail with examples:

- Dynamic Nature of Search Engine Algorithms:** The continuous evolution of search engine algorithms poses a significant challenge for marketers and businesses. For instance, Google's algorithm updates, like the BERT update focusing on understanding natural language queries, can dramatically impact search rankings. Consider a small e-commerce business that sees a sudden drop in traffic and sales following a major algorithm update, forcing them to reassess their SEO strategies and adapt to the new ranking factors.
- Fierce Market Competition:** With millions of websites competing for visibility, standing out in search results is increasingly challenging. Take the hospitality industry, for example, where hotels vie for top rankings in destination-specific searches. A boutique hotel may struggle to compete against large chains with extensive resources for SEO optimization and marketing efforts, requiring them to find innovative ways to differentiate themselves and attract organic traffic.
- Ever-Evolving Digital Landscape:** The rapid pace of technological advancements and shifts in consumer behavior present ongoing challenges for SEO practitioners. Consider the rise of voice search technology, which has altered search query patterns and user expectations. A local restaurant chain may need to optimize its online presence for voice search queries, ensuring its business information is accurately represented in local directories and voice assistant platforms to maintain visibility and attract customers.
- Algorithm Updates Impacting Rankings:** Search engine algorithm updates, such as Google's Core Web Vitals update focusing on page experience signals, can significantly impact website rankings and traffic. For instance, a news website may see fluctuations in its search rankings and traffic following algorithm updates that prioritize page speed and mobile-friendliness. Adapting to these changes requires ongoing monitoring, analysis, and optimization of technical aspects to maintain visibility and user satisfaction.
- Maintaining Relevance Amidst Changing Consumer Behavior:** Understanding and adapting to shifts in consumer behavior is crucial for effective SEO strategies. For example, a fashion retailer may notice changes in consumer preferences towards sustainable fashion and ethical sourcing. By incorporating relevant keywords and content addressing these trends into their SEO strategy, the retailer can align with consumer interests and improve organic visibility among environmentally conscious shoppers.
- Resource Allocation for Effective SEO:** Allocating resources effectively is a constant challenge for businesses aiming to stay ahead in the SEO game. Consider a startup company with limited resources deciding where to invest their SEO efforts. They must prioritize initiatives that yield the highest return on investment, whether it's optimizing website content, building quality backlinks, or investing in technical improvements. Striking the right balance between different SEO tactics while working within budget constraints is essential for achieving sustainable growth in organic search traffic.

Navigating the complexities of modern SEO requires addressing primary challenges such as dynamic algorithm updates, fierce market competition, and evolving consumer behavior. By understanding these challenges and leveraging strategic approaches tailored to their specific industry and audience, marketers and businesses can overcome obstacles and achieve success in organic search rankings.

RQ3: Current Best Practices in SEO Optimization:

Analysis of current best practices in SEO optimization highlights the importance of a holistic approach encompassing content quality, technical optimization, and user experience. Here are some strategies with detailed examples:

- a) **High-Quality Content Creation:** Producing informative, engaging content tailored to the target audience is paramount for SEO success. For example, a fitness blog might regularly publish in-depth articles on topics like workout routines, nutrition tips, and wellness advice. By providing valuable information that addresses the needs and interests of their audience, the blog can attract organic traffic and earn backlinks from authoritative sources.
- b) **Optimizing for Mobile and Voice Search:** With the increasing prevalence of mobile devices and voice-activated assistants, optimizing websites for mobile-friendliness and voice search is essential. For instance, an e-commerce store selling home decor items may ensure that its website loads quickly on mobile devices, offers a seamless shopping experience, and includes natural language phrases in its product descriptions to align with voice search queries. This proactive approach enhances user satisfaction and improves search engine rankings.
- c) **Prioritizing Website Speed and Performance:** Website speed and performance significantly impact user experience and search engine rankings. Take, for example, an online news publication. By optimizing image sizes, leveraging browser caching, and minimizing server response times, the publication can reduce page load times and provide a smoother browsing experience for readers. This not only improves user engagement but also signals to search engines that the website is well-maintained and user-friendly, thereby boosting its visibility in search results.
- d) **Leveraging Structured Data Markup:** Implementing structured data markup, such as Schema.org markup, enables search engines to better understand the content of web pages. For instance, a local restaurant can use structured data markup to mark up its menu items, business hours, and customer reviews. This structured data provides search engines with rich snippets to display in search results, enhancing the visibility and relevance of the restaurant's listings.
- e) **Building Authoritative Backlinks:** Acquiring high-quality backlinks from reputable websites is a cornerstone of effective SEO. Consider a software company launching a new product. By reaching out to industry influencers, participating in relevant forums, and guest blogging on reputable tech websites, the company can earn valuable backlinks that boost its website's authority and credibility in the eyes of search engines.
- f) **Fostering Engagement Through Social Media:** Social media engagement can indirectly impact SEO by driving traffic, increasing brand visibility, and generating social signals that influence search engine rankings. For example, a fashion retailer may use Instagram to showcase its latest collections, engage with followers through interactive content, and encourage user-generated content through branded hashtags. This active social media presence not only cultivates a loyal community but also amplifies the retailer's online presence, leading to improved search visibility.

Effective SEO optimization requires a strategic and multifaceted approach that encompasses content quality, technical optimization, and user engagement. By implementing these best practices and staying attuned to industry trends, marketers and businesses can navigate the complexities of modern SEO successfully and achieve sustainable growth in organic search traffic.

DISCUSSION

The findings of research shed light on the dynamic landscape of search engine optimization (SEO), offering valuable insights into its evolution, challenges, and best practices. In this discussion section, we delve deeper into the implications of the research findings and provide analysis on their significance for marketers, businesses, and the broader digital ecosystem.

Evolution of Search Engine Algorithms: The evolution of search engine algorithms has fundamentally reshaped SEO practices, transitioning from simplistic keyword-centric approaches to sophisticated, user-centric strategies. Our analysis highlights the pivotal role of algorithm updates, such as Google's PageRank and subsequent Panda and Penguin updates, in driving this transformation. This evolution underscores the

importance of adapting SEO strategies to align with search engine algorithms' emphasis on relevance, quality, and user experience.

Primary Challenges in Implementing Effective SEO Strategies: The identification of primary challenges in executing effective SEO strategies illuminates the multifaceted nature of modern SEO. The dynamic nature of search engine algorithms, coupled with intense market competition and evolving consumer behavior, poses significant hurdles for marketers and businesses. Our analysis underscores the importance of agility and adaptability in navigating these challenges, as well as the need for a holistic approach that balances technical optimization, content quality, and user experience.

Current Best Practices in SEO Optimization: The delineation of current best practices in SEO optimization provides actionable insights for enhancing online visibility and engagement. Strategies such as producing high-quality, relevant content, optimizing for mobile and voice search, and prioritizing website speed and performance emerge as key recommendations. Additionally, leveraging structured data markup, building authoritative backlinks, and fostering engagement through social media are crucial for maximizing SEO effectiveness.

Implications and Future Directions: Our research findings have several implications for marketers, businesses, and SEO practitioners. Firstly, they underscore the importance of staying abreast of evolving search engine algorithms and industry trends to remain competitive in the digital landscape. Additionally, they emphasize the need for a holistic and integrated approach to SEO that encompasses content quality, technical optimization, and user experience. Future research directions may include exploring the impact of emerging technologies, such as artificial intelligence and voice search, on SEO practices, as well as investigating strategies for optimizing SEO in niche or specialized industries.

CONCLUSION

Our study offers a comprehensive examination of the evolution, challenges, and best practices of search engine optimization (SEO). Through an analysis of industry trends, expert opinions, and empirical data, we have provided valuable insights into the dynamic landscape of SEO and its implications for marketers, businesses, and the broader digital ecosystem.

The findings of our research underscore the importance of adapting SEO strategies to align with evolving search engine algorithms, market dynamics, and consumer behavior. From the early days of keyword-centric approaches to the contemporary emphasis on user-centric, high-quality content, SEO has undergone significant transformation, necessitating a holistic and integrated approach for success.

As we navigate the complexities of modern SEO, agility, adaptability, and a commitment to continuous learning emerge as crucial factors for success. By leveraging current best practices, staying abreast of emerging trends, and embracing innovation, marketers and businesses can enhance their online visibility, engagement, and ultimately, their success in the digital landscape.

By embracing these insights and adopting a proactive approach to SEO, businesses can position themselves for sustainable growth and success in an increasingly competitive digital environment.

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